

MODERN STATISTIC METHODS FOR RATING OF HEALTH CONDUCT

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The theory of the statistics has created promising means for objective classification objects. One of the modern methods fit to solve such problems is the method of Mahalanobis. The point of the matter is in the statistic measuring of the distance of objects up to one form accepted as ideal. The number of the objects can be unlimited. The number of the indexes according to which the classification is done can be unlimited, too. As indexes can be included quantitative as well as qualitative characteristics of the objects. All indexes are accepted as equal of importance. The ideal form belongs to the combination possessing optimal values of all indexes. The object being away at a minimum distance is to be placed first. Especially useful is the method in the cases in which the characteristics of the different objects are not unidirectional and their ordinary ranking is becoming difficult due to the repeated crossing and the different arranging in the series. The method of Mahalanobis unknown up to now in the solving of the medical problems can be applied, in our opinion, in comparison with the different strategies and tactics of health conduct. In the present development, this is demonstrated by rating and comparing of therapeutical conduct when fresh fractures are available in the distal end of the adult patient's thigh bone. The results have been analyzed on a total of 90 patients, 44 of which under conservative and 46 - under operative treatment. The cases are distributed according to the character of the therapeutic conduct, as follows: Conservative treatment - I group (treated with plaster or a short-lived extension followed by plaster immobilization) - 20 cases; II group (treated with direct extension followed by plaster immobilization) - 24 cases. Operative treatment - III group (with osteosynthesis with a plate in a "I" shape) - 17 cases; IV group (with osteosynthesis with properly modified plates in a "I" shape) - 12 cases; V group (with osteosynthesis with properly moulded nails of Ender) - 17 cases. The author of the modifications and rationalizations is D-r Ivan Savchev, Department of Orthopedics and Traumatology, Medical University of Varna. As indexes for the rating of therapeutical conduct at the distal thigh bone fractures the following

treatment results are used: shortening (in %), broken joint congruity (in %), angle aberrations (in %), knee flexion (in %) and the days passed in the hospital. The results received in the 5 groups are as follows:

Table 1

Indexes	Therapeutical conduct				
	1gr	2gr	3gr	4gr	5gr
Shortening	45%	54,2%	35,3%	33,3%	5,9%
Broken joint congruity	25%	12,5%	11,8%	8,3%	5,9%
Angle aberration	40%	58,3%	58,8%	16,7%	11,8%
Flexion	82,3°	67,5°	81,2°	83,3°	106,7°
Days in the hospital	17,9	64,9	44,3	35,6	28,3

The impossibility for categorical and simple conclusions as a result of the routine statistical methods necessitates the objectivity in the rating and the methods used for treatment of the distal thigh bone fractures to be effected according to the Mahalanobis method. The method is based on the distance measured between the really obtained results during the treatment reaching the "ideal form", i.e. healthy man. In the specific case it concerns the minimizing of the indexes hospital days, shortening, broken joint congruity, angle aberrations and maximizing the results relating to the knee flexion. The technology of the statistic processing is according some formulas. The following results have been received (table 2) which are placing the methods of treatment as it indicated in the last column of table 2.

Table 2

Indexes	Therapeutical conduct				
	1gr	2gr	3gr	4gr	5gr
T ₁	0	1,82	1,02	0,69	0,40
T ₂	1,18	1,46	0,89	0,83	0
T ₃	2,01	0,69	0,62	0,26	0
T ₄	0,88	1,44	1,46	0,15	0
T ₅	-0,95	-1,52	-0,99	-0,91	0
P	7,1	10,28	5,32	2,09	0,40
Rank N	4	5	3	2	1